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PATENT NREL 01-36

Amendments to the claims:

Please amend the claims as shown below...

- 1. (Currently amended) A composition comprising a <u>genetically</u> engineered purified polypeptide <u>expressed in a heterologous host cell, with said polypeptide having</u> cellulase activity and having at least <u>90%</u> 99% identity to SEQ ID NO. 1.
- (Currently amended) The composition of claim 1 wherein the polypeptide comprises a catalytic domain of a glycosyl hydrolase family 74 (GH74_Ace) enzyme defined as including the polypeptide sequence of SEQ ID NO: 3, a carbohydrate binding domain (CBD) III, a linker, and a signal sequence.
 - 3. (Cancelled).
- 4. (Previously presented) The composition of claim 2 wherein the carbohydrate binding domain (CBD) III of the polypeptide is further defined as comprising a length of about 80 to about 150 amino acids.
- 5. (Previously presented) The composition of claim 2 wherein the carbohydrate binding domain (CBD) III of the polypeptide is further defined as comprising a length of about 90 amino acids.
 - 6. (Cancelled).
- 7. (Previously presented) The composition of claim 2 wherein the carbohydrate binding domain (CBD) III is further defined as comprising the polypeptide sequence of SEQ ID NO: 4.
- 8. (Previously presented) The composition of claim 2 wherein the carbohydrate-binding domain (CBD) III is further defined as comprising the polypeptide sequence of SEQ ID NO: 5.
- 9. (Previously presented) The composition of claim 2 wherein said polypeptide comprises sequences identical to the polypeptides of SEQ ID NO: 3 and SEQ ID NO: 4.

10-11. (Cancelled)

12. (Currently amended) A <u>genetically engineered</u> purified polypeptide <u>expressed in a heterologous host cell, said polypeptide</u> having at least <u>90%</u> 99% identity to SEQ ID NO: 1.

- 13. (Cancelled)
- 14. (Previously presented) An industrial mixture suitable for degrading cellulose, such mixture comprising the polypeptide of claim 1.
- 15. (Previously presented) The industrial mixture of claim 14 further defined as comprising a detergent.

16-27 (Cancelled)

- 28. (Currently amended) A <u>composition comprising a genetically engineered purified</u> polypeptide <u>expressed in a heterologous host cell, said polypeptide</u> having at least <u>90%</u> 99% identity to [a] <u>the polypeptide sequence selected from the group consisting</u> of:
- ——a) SEQ ID NO: 3,; said polypeptide having catalytic activity of a glycosyl hydrolase family 74 (GH74 Ace) enzyme.
 - b) SEQ ID NO: 4:
- ---- c) SEQ ID NO: 5; and
- d) SEQ-ID-NO: 1.
 - 29. (Cancelled)
- 30. (Original) A fusion protein comprising the polypeptide of claim 28 and a heterologous peptide.
- 31. (Currently amended) The fusion protein of claim 30, wherein the heterologous peptide is a substrate targeting moiety <u>and said substrate is a carbohydrate polymer</u>.
- 32. (Original) The fusion protein of claim 30, wherein the heterologous peptide is a peptide tag.
- 33. (Previously presented) The fusion protein of claim 32, wherein the peptide tag is 6-His, thioredoxin, hemaglutinin, glutathione S-tranferase, or OmpA signal sequence tag.
- 34. (Original) The fusion protein of claim 30, wherein the heterologous peptide is an agent that promotes polypeptide oligomerization.
- 35. (Original) The fusion protein of claim 34, wherein the agent is a leucine zipper.

- 36. (Previously presented) A cellulase-substrate complex comprising the polypeptide of claim 28 bound to cellulose.
 - 37-42 (Cancelled)
- 43. (Previously presented) A composition comprising the polypeptide of claim 28 and a carrier.
 - 44-46. (Cancelled)
 - 47. (Cancelled)
- 48. (Currently amended) The composition of claim <u>1</u> 47 wherein said polypeptide retains at least the same level of cellulase activity and thermal tolerability as those exhibited by the peptide of SEQ ID NO. 1.
 - 49. (Cancelled)
- 50. (Currently amended) The A composition comprising a genetically engineered polypeptide expressed in a heterologous host cell, said polypeptide having at least 90% identity to SEQ ID NO. 1, said polypeptide comprising a ef claim 49 wherein said catalytic domain of a glycosyl hydrolase family 74 (GH74 Ace) enzyme GH74_Ace having a sequence identical to SEQ ID NO. 3 in each conserved position marked by an asterisk (*), as shown below in comparison to Aspergillus aculeatus Avicelase III (AviIII_Aac):

GH74_Ace	ATTQPYTWSNVAIGGGG-FVDGIVFNEGAPGILYVRTDIGGMYRWDAANGRWIPLLDWVG
AviIII_Aac	AASQAYTWKNVVTGGGGGFTPGIVFNPSAKGVAYARTDIGGAYRLNSDD-TWTPLMDWVG
	र्राष्ट्रामें स्थित संस्थित संस्थान हो। प्रतिस्था तो से स्ट्रिय प्रतिस्थान संस्था है। हो। स्वास्ति स्थान
GH74_Ace	wnnwgyngvvsiaadpintnkvwaavgmytnswdpndgailrssdqgatwqitplpfklg
AviIII_Aac	NDTwhdwgidalatdpvdtdrvyvavgmytnewdpnvgsilrstdqgdtwtetklpfkvg
	ा.ते. त्रे, इत्तरक्षेत्रात्रहाइक्ष्रीत्रक्षेत्रकेष्ठे के स्वत्ते क्ष्रीकेष के क्ष्रीक के क्ष्रीक के क्ष्रीक के
GH74_Ace	Gnmpgrgmgerlavdpnndnilyfgapsgkglwrstdsgatwsqmtnfpdvgtylanptd
AviIII_Aac	GNMPGRGMGERLAVDPNKNSILYPGARSGHGLWKSTDYGATWSNVTSFTWTGTYFQDSSS
GH74_Ace	TTGYQSDIQGVVWVAfdksssslgqasktifvgvadpnnpvfw8RDggatwqavpgap-t
AviIII_Aac	TYTSDPVGIAWVTFDSTSGSSGSATPRIFVGVADAGKSVFKSEDAGATWAWVSGEPQY
	* * ** ** **;**;**;;**;;* *;*; *******;;;;** *;*;**** *;*;*
GH74_Ace	GFIPHKGVFDPVNHVLYIATSNTGGPYDGSSGDVWKFSVTSGTWTRISPVPSTDTANDYF
AviIII_Aac	GFLPHKGVLSPEEKTLYISYANGAGPYDGTNGTVHKYNITSGVWTDISFT\$LASTYY
	. **;******;; = ;;.***; ;* ;*****;;* * *;.;***,** *** . *; *; *; *; *;

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GK74_Ace	GYSGLTIDRQHPNTIMVATQISWWPDTIIFRSTDGGATWTRIWDWTSYPNRSLRYVLDIS
Avilli_Aac	GYGGLSVDLQVPGTLMVAALNCWWPDELIFRSTDSGATWSPIWEWNGYPSINYYYSYDIS
	********* * **************************
GH74_Ace	AEPWLTFGVQPNPPVPSPKLGWMDEAMAIDPFNSDRMLYGTGATLYATNDLTKWDSGGQ1
AviIII_Aac	NAPWIQDTTSTDQFP - VRVGWMVEALAIDPFDSNHWLYGTGLTVYGGHDLTNWDSKHNV
	लनेर १२४१ राजेनेन समारमप्रसम्बद्धाः क्षेत्रकेष के _{र्} के रक्षेत्रकेरणाहरू १३
GH74_Ace	HIAPMVKGLEETAVNDLISPPSGAPLISALGDLGGFTHADVTAVPSTIPTSPVFTTGTSV
AviIII_Aac	TVKSLAVGIREMAVLGLITPPGGPALLSAVGDDGGFYHSDLDAAPNQAYHTPTYGTTNGI
	र ४१. मेर्ने ने उन्हें के उन्हें
GH74_Ace	DYAPLNPSIIVRAGSFDP\$\$QPNDRHVAF\$TDGGKNWFQGSEPGGVTTGGTVAASADG\$R
AviIII_Aac	DYAGNKPSNIVRSGASDDYPTLALSSNFGSTWYADYAASTSTGTGAVALSADGDT
-	*** :** x**:*; * . : :*:*;; *,.*: * *;** ****.
CUTA DOS	
GH74_Ace	FVWAPGDPGQPVVYAVGFGNSWAASQGVPANAQIRSDRVNPKTFYALSNGTFYRSTDGGV
AviIII_Aac	VLLMSSTSGALVSKSQGTLTAVS9LPSGAVIASDKSDNTVFYGGSAGAIYVSKNTAT
	ा १६०४-४९ वर्षे । इ.स. १०० इस ४४३९६५९ हे हेन्द्र इ.४४९५ ५ सहस्य स्टब्स्ट ३००० -
GH74_Ace	tfqfvaaglpssgavgvmfhavpckegdlwlaassglyhstnggsswsai-tgvssavnv
AviIII_Aac	sftktvs-lgssttvnair-ahpsiagdvwastdkglwhstdygstptqigsgvtagwsf
	- 1* - 111 * ** 1*,11 * * *. ** 1 * 11. **1*** 11. **1**1 * 1**11. * 1**11. * 1
GH74_A¢e	GFGKSAPGSSYPAVFVVGTIGGVTGAYRSDDCGTTWVLINDDQHQYGN WGQAITGDHAN
AviIII_Aac	GFGKASSTGSYVVIYGFFTIDGAAGLFKSEDAGTNWQVISDA6HGFGSGSANVVNGDLQT

GH74_Ace	LRRVYIGTNGRGIVYGDIGGAPSG
AvilII_Aac	YGRVFRGHERPGHLLRQSQREPAG
	*** * 1 * 1 * 1 * 1 * 1

- 51. (Currently amended) The composition of claim 49 50 wherein said polypeptide retains at least the same level of cellulase activity and thermal tolerability as those exhibited by the peptide of SEQ ID NO. 1.
- 52. (Currently amended) A composition comprising a genetically engineered purified polypeptide expressed in a heterologous host cell, said polypeptide having an amino acid sequence identical to SEQ ID NO. 1, said polypeptide characterized by a catalytic domain of a glycosyl hydrolase family 74 (GH74_Ace) enzyme and a carbohydrate binding domain (CBD) III.

53. (Currently amended) A composition comprising a genetically engineered purified polypeptide expressed in a heterologous host cell, said polypeptide being characterized by a catalytic domain of a glycosyl hydrolase family 74 (GH74_Ace) enzyme and a carbohydrate binding domain (CBD) III, said catalytic domain of GH74_Ace having a sequence that is at least 90% 99% identical to SEQ ID NO. 3.

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- 54. (Currently amended) The composition of claim <u>53</u> 51 wherein said catalytic domain of GH74_Ace has a sequence identical to SEQ ID NO. 3.
- 55. (Currently amended) A composition comprising a genetically engineered polypeptide expressed in a heterologous host cell, said polypeptide having at least 90% 99% identity to SEQ ID NO. 1.
- 56. (Currently amended) A composition comprising a genetically engineered polypeptide expressed in a heterologous host cell, said polypeptide comprising a sequence having at least 90% 99% identity to SEQ ID NO. 3.
- 57. (New) A composition comprising a genetically engineered polypeptide expressed in a heterologous host cell, said polypeptide having at least 90% identity to the polypeptide sequence of SEQ ID NO: 4 and having carbohydrate binding activity.
- 58. (New) A composition comprising a genetically engineered polypeptide expressed in a heterologous host cell, said polypeptide having at least 90% identity to the polypeptide sequence of SEQ ID NO: 5 and having carbohydrate binding activity.
- 59. (New) A composition comprising a genetically engineered polypeptide expressed in a heterologous host cell, said polypeptide having means for providing cellulase activity as a glycosyl hydrolase 74 (GH74) family enzyme according to SEQID NO. 1.